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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,158	07/08/2003	Karim Faid	PAT 930-2	6471
26123 7590 05/16/2007 BORDEN LADNER GERVAIS LLP WORLD EXCHANGE PLAZA 100 QUEEN STREET SUITE 1100 OTTAWA, ON K1P 1J9 CANADA			EXAMINER LEVKOVICH, NATALIA A	
			ART UNIT 1743	PAPER NUMBER
			MAIL DATE 05/16/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/614,158

Applicant(s)

FAID ET AL.

Examiner

Natalia Levkovich

Art Unit

1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 22-45 is/are pending in the application.
- 4a) Of the above claim(s) 22-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-6 and 30-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-6 and 22-45 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Election/Restriction***

1. Applicant's election with traverse of claim group I (claims 1-21) in the reply dated 09/05/2006 is acknowledged. The traversal is on the grounds that the inventions of claim groups I and III are related, and , therefore, 'it would not be possible to perform a search for the product outlined in Claim Group 3 without doing a search for the method outlined in Claim Group 1'. This is not found persuasive because, while the inventions I and III are directed to the related apparatus, they are distinct. The related inventions are distinct if the (1) the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect; (2) the inventions do not overlap in scope, i.e., are mutually exclusive; and (3) the inventions as claimed are not obvious variants. See MPEP § 806.05(j). In the instant case, the method of making the molecular imprinted sensor is not usable together with the method of detecting of chemical targets; the two methods have different modes of operation, functions, or effects. Additionally, inventions I and III are classified in different classes, as was discussed in the prior Office Action. The respective searches would not overlap, and would require different strategies. Therefore, examination of groups I and III would place an undue burden to the Examiner.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-11 and 16-21 are rejected under 35 U.S.C. 112, second paragraph, as being unclear for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention and for being incomplete for omitting essential steps. See MPEP § 2172.01.

In claim 1, the step of 'reacting the molecular target bound solid support with at least one guest molecule thus forming a solid support stamp having a binding cavity around the molecular target' (step c), is followed by the step of 'applying the solid support stamp to a surface of a solid substrate to attach the binding cavity' (step d). It is unclear what method steps would provide such an attachment. Are the missing steps related to selecting substrate materials and / or a certain type of guest molecules, or coating (or other types of pre-treatment) of the substrate surface, or to the time of applying the stamp, or to the amount of applied force, or to providing any particular environmental, or other process conditions?

In claim 7, 'the coated slide' lacks antecedent basis.

***Claim Rejections - 35 USC § 103***

4 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-5 and 7-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yilmaz et al. (US 20040157209) in view of Whitesides et al. (Annu. Rev. Biomed. Eng. 2001. 3:335–73).

Yilmaz et al. disclose molecularly imprinted polymers ['detection devices' – Ex.] comprising tailor-made recognition sites for a target made by "polymerising functional monomers ['guest molecules' – Ex.]...in the presence of at least one template ['molecular target' – Ex] immobilised on a support material in a polymerisation process, whereby non-covalent or covalent [bonds] are formed between said functional monomers and said immobilised template(s)', and,

Art Unit: 1743

finally, by 'removing said template(s), and said support material from the molecularly imprinted polymer." (Abstract).

Although Yilmaz does teach the use of the molecularly imprinted polymers ['detection devices' – Ex.] in 'recognition elements' /sensors, the reference does not specifically disclose the step of applying the obtained stamp to the surface of a solid substrate. However, such microcontact printing (CP) is well known in the art (see, for example, page 341 of Whitesides et al.). Whitesides also teaches at page 337 that, "as the size of devices decreases, their surface-to-volume ratios increase, and their surface properties become increasingly important in determining their performance". It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the stamp to a solid support in the modified method of Yilmaz, in order to obtain a sensor with improved surface-to-volume characteristics.

With respect to claims 2, 4 and 13, Yilmaz discloses, in paragraph [0004], methacrylic acid and 4-vinylpyridine as an example of functional monomers / 'guest molecules', capable of being used as recognition sites.

As to claims 3 and 14, Yilmaz teaches in [0051] that a " MIP prepared with an immobilized template ['molecular target' – Ex] is used as a nano-cavity ".

In reference to claim 5, Yilmaz does not teach silicon wafers. However, silicon supports are routinely used in manufacture of micro-circuits (see, for example, page 342 of Whitesides et al.). It would have been clearly within the ordinary skill of an artisan at the time the invention was made to have employed silicon wafers in the modified method of Yilmaz as well-proven and commercially

Art Unit: 1743

available supports with desired chemical and mechanical characteristics needed for particular applications.

In regards to claims 7-8 and 17-19, Yilmaz teaches glass and gold supports in [0018]

With respect to claims 10 and 21, although Yilmaz does not teach the use of two different molecularly imprinted polymers located in different areas of the substrate, it would have been clearly within the ordinary skill of an artisan at the time the invention was made to have employed more than one polymer in the modified method of Yilmaz, in order to maximize the number of tests that can be carried out simultaneously.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yilmaz et al. in view of Whitesides et al., and further in view of Bolshakova et al. (Ultramicroscopy, Volume 86, Issues 1-2, January 2001, Pages 121-128).

Yilmaz does not disclose treating the support with aminosiloxane. However, the use of aminosilanes has become a common technique for covalent linkage of biomolecules to glass in biosensor and DNA chip fabrication.

For example, Bolshakova et al. teach silanization of mica (glass) with trialkoxyaminoalkylsilanes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have treated the solid supports with aminosiloxane, in the modified method of Yilmaz, in order to facilitate immobilization of the template molecules.

### ***Response to Arguments***



8. Applicant's arguments filed on 02/14/2007 have been fully considered but they are not persuasive, or moot in view of new grounds of rejection.

Applicant traverses the 35 U.S.C. 112, second paragraph, rejection of claim 1 stating that there no missing method steps between step (c) and (d) of the instant claim 1 because 'the attachment of the binding cavity to the solid substrate can be made by any number of ways, with or without modification of the monomers or polymers to attach the binding cavity on the stamp covalently or non-covalently to the solid substrate' and because some examples of the instant disclosure illustrate the attachment being conducted without surface pre-treatment, but, for example, via forming 'surface bonds' between the substrate and thiol groups of the binding cavity, or via 'through covalent or non-covalent interactions' between the cavity and substrate. Examiner agrees that surface pre-treatment is only one of the options available (see the above discussion) and notes that the possibility of forming the bonds mentioned by Applicant with regards to the cited examples is based on a proper selection of substrate materials (or functional groups) and guest molecules which 9for this type of the process scenario) would constitute the missing step.

Applicant argues that 'Yilmaz does not specifically disclose the step of applying the obtained stamp to the surface of a solid substrate . Yilmaz neither teaches nor suggests that the contemplated molecularly imprinted polymers can be supported to a substrate' and that this deficiency is not cured by Whitesides . Examiner disagrees. Yilmaz discloses the use of the molecularly imprinted



polymers in sensors (that is, supported by a solid element / substrate (see the discussion above) which provides the motivation to develop the step of applying the stamp to the substrate, in view of Whitesides disclosing the micro-contact printing and the miniaturization trends.

Regarding Applicant's arguments about 103(a) rejection of claim 6, examiner maintains that Yilmaz discloses glass substrates and Bolshakova et al. teach silanization of mica /glass (see above). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have treated the solid supports with aminosiloxane, in the modified method of Yilmaz, in order to facilitate immobilization of the template molecules.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:


Dai et al. (US 6251280) – discloses binding template molecules to substrate via bifunctional ligands;

Lahann et al. (US 7020355) – discloses coated substrates used in soft lithography.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Levkovich whose telephone number is 571-272-2462. The examiner can normally be reached on Mon-Fri, 8 a.m.-4p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jill Warden  
Supervisory Patent Examiner  
Technology Center 1700